L. W. BROADWELL.

Breech-loading Ordnance.

No. 55,609. Patented June 19, 1866

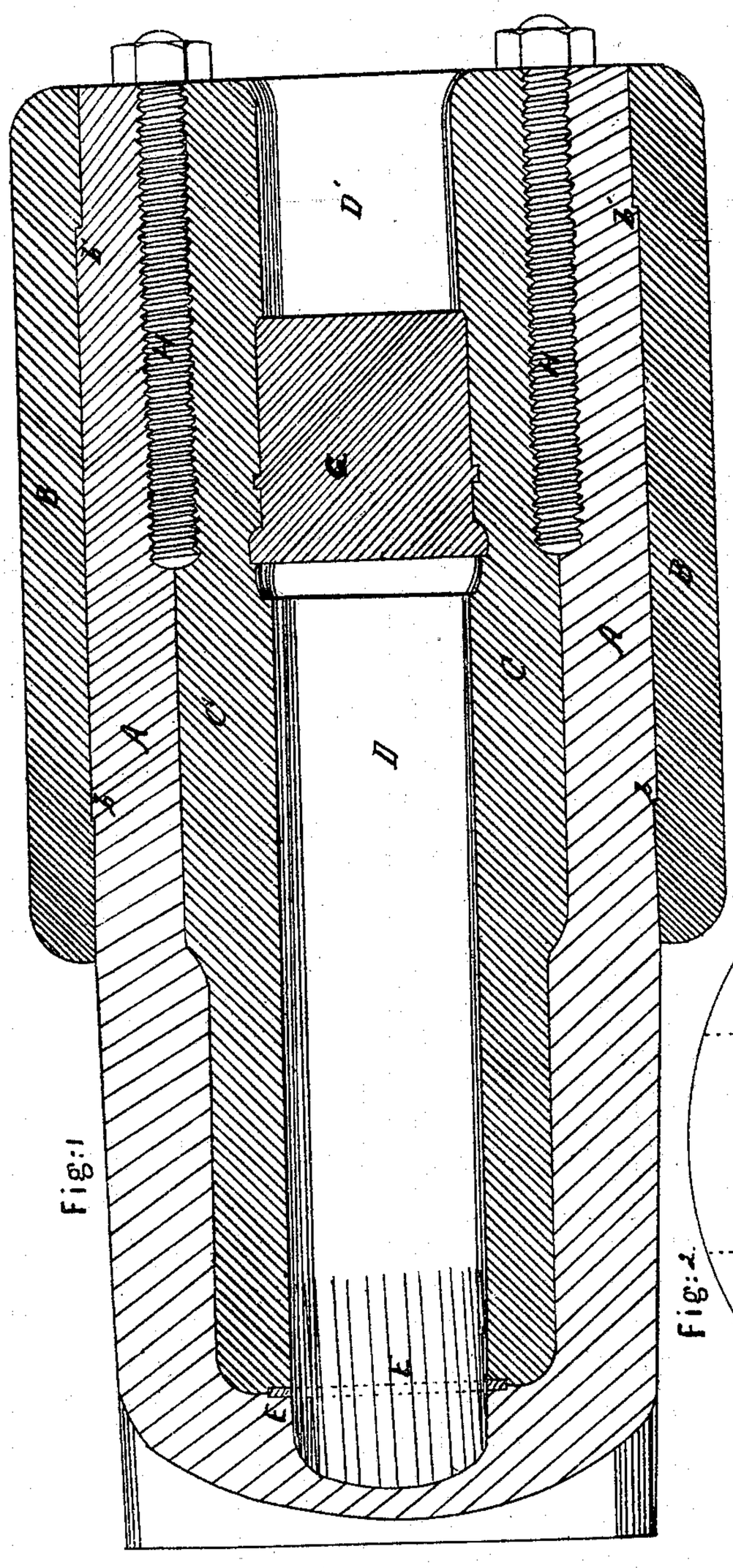

Fig: 1

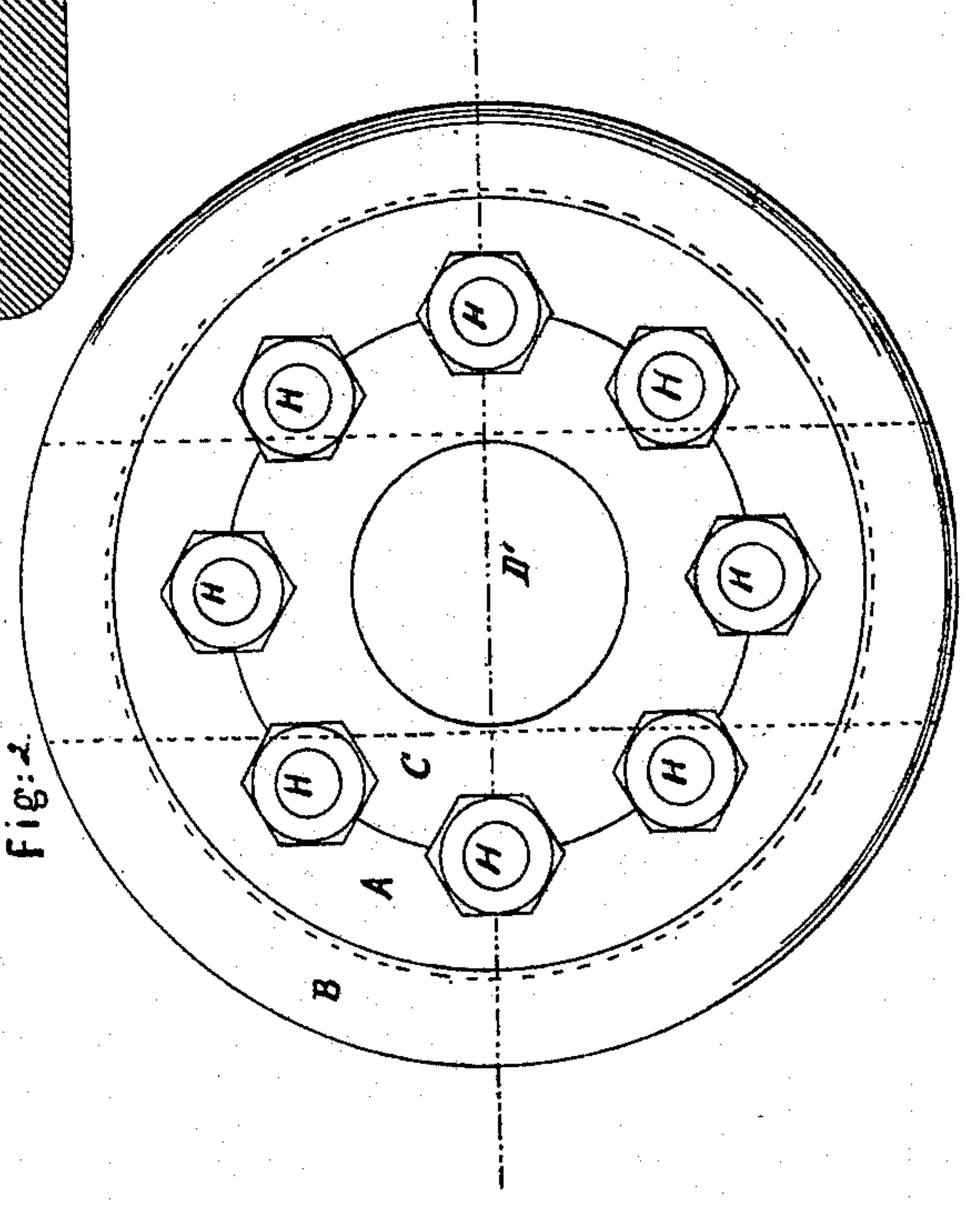

Fig: 2

Witnesses:

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UNITED STATES PATENT OFFICE.

L. W. BROADWELL, OF NEW ORLEANS, LOUISIANA.

IMPROVEMENT IN ORDNANCE.

Specification forming part of Letters Patent No. **55,609**, dated June 19, 1866.

To all whom it may concern:

Be it known that I, LEWIS W. BROADWELL, of New Orleans, in the State of Louisiana, have made new and useful Improvements in Ordnance; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, sufficient to enable one skilled in the art to which it appertains to construct and use the same, reference being had to the accompanying drawings, which are made part of this specification, and in which—

Figure 1 is a longitudinal central section through the axis of the rear portion of a gun constructed according to my improvement. Fig. 2 is a rear elevation.

The improvements consist in the manner of applying the exterior and interior re-enforces.

The external re-enforce is shrunken on over an enlargement on the breech of the gun, so as in shrinking to have a tension longitudinally upon the gun to prevent rupture transversely of the piece—that is, in addition to the binding pressure of the re-enforce in a direction toward the axis of the gun and by a strain upon the edges or shoulders of the enlargement it tends to prevent the blowing off of the end of the gun, thus compensating for the weakness caused by the mortise made for the reception of breech-loading mechanism.

The internal re-enforce may be originally inserted in the construction of the piece, or it may be fitted into a chamber formed by the enlargement of the rear portion of the bore of the gun. The joint formed at the forward end of the internal re-enforce is packed with a copper or other soft-metal ring, as shown at E, to prevent the escape of gas between the re-enforce and the body of the gun.

The internal re-enforce is secured in position by screws which take half in the internal re-enforce and half in the surrounding metal of the gun.

In the drawings, A is the metal of the gun proper, and B is the external re-enforce. On the portion A is an enlargement whose edges are represented by *b b′*, of which the forward one, *b*, is less in depth than the rearward one, *b′*, for the reason that after the re-enforce is expanded by heat the forward end must be slipped over the enlargement, which extends from *b* to *b′*, so that, on contracting, the depression in the inside of the re-enforce may be occupied by the enlargement.

The edge *b′* may be of greater depth, if required, as the shoulder of the depression in the re-enforce is only slipped up to it and is not compelled to be passed over the enlargement.

The internal re-enforce is inserted from the rear. The piece of ordnance to which it is represented as applied is a breech-loader.

The internal re-enforce may be inserted into the bore of a gun which has been bored out larger so as to receive it, or it may be primarily in a gun when first constructed. It may be used to render serviceable a gun which has been worn or honey-combed, the internal re-enforce forming a new loading-chamber, adding strength to the piece, together with the smoothness and accuracy requisite. Having been turned off to fit the chamber in the gun A, which has been prepared for it, it is inserted into its place and driven home against the packing of soft metal E, which makes a tight joint at the only place exposed to the entrance of the gas in the act of firing. It is then secured in position by boring holes, half in the portion A and half in the interior re-enforce, C, into which holes are inserted the screws H H, &c., which, retaining a hold upon each of the portions A and C, prevent their being separated by an end strain, which would tend to remove the internal re-enforce.

The method of applying these re-enforces has a material bearing upon results which will be obtained. Improperly applied they will be valueless; properly applied they will render a cast-iron gun equally strong with either a solid wrought-iron or steel gun of the same dimensions.

I first apply the external re-enforce as follows: If the piece be an old one, then the breech is turned to the shape indicated in the drawings, with an enlargement having the shoulders *b b′*. The external re-enforce or jacket is then turned internally with a corresponding recess, which must be about two one-hundreths of an inch less in its dimensions than those of the enlargement on the breech of the gun, so that when the jacket is placed in position and shrinks it shall be left in a state of initial tension. This condition of things secures simultaneous action on the part

of the re-enforce and the cast-iron which it re-enforces.

I now bore out the chamber for the internal re-enforce and fit the same therein so that it shall not be too loose nor too tight. If too loose, then it will not receive aid at the proper moment from the surrounding metal, and if too tight too much initial strain will be thrown upon the surrounding cast-iron; but it should be so fitted that it will expand under the force of the charge to just within its elastic limit, and then bring into requisition the whole combined strength of the surrounding metals, consisting of the cast-iron body of the gun and the external steel re-enforce. Thus the shock of the discharge is felt and resisted by the entire mass of metals at the same instant, and consequently the whole strength thereof is utilized in the most perfect and only practical manner.

When this invention is to be applied to new guns the external shape and the chamber for the internal re-enforce should be formed in the casting thereof.

Having described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

The exterior re-enforce, B, with a depression on its interior periphery corresponding to the enlargement on the gun, with shoulders *b b'*, substantially as and for the purpose described.

L. W. BROADWELL.

Witnesses:

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W. F. HALL.